

IN THE CLAIMS

Claims 1-137 are presented below:

Claims 1-111 (canceled).

112. (Currently Amended) A method of forming a barrier metal film formed of a nitride film including tungsten by thermal CVD, comprising:

positioning a substrate in a processing vessel;

~~maintaining a pressure in~~ evacuating the processing vessel;

forming a film containing tungsten on one side of the substrate by supplying a process gas including WF<sub>6</sub> gas and SiH<sub>4</sub> gas into the processing vessel;

shutting off the supplying of the process gas into the processing vessel;

completely removing the process gas from the processing vessel by supplying a purging gas into the processing vessel, while evacuating the processing vessel; and

nitriding the film containing tungsten by supplying NH<sub>3</sub> gas.

113. (Previously Presented) The method according to Claim 112, wherein the nitriding of the film is performed by generating plasmas.

114. (Currently Amended) The method according to Claim 112, wherein the ~~forming of the film and~~ nitriding of the film are ~~is~~ performed in the same processing apparatus or different another processing apparatus vessel.

115. (Previously Presented) The method according to Claim 112 wherein said nitriding comprises supplying at least one of MMH and N<sub>2</sub>.

116. (Previously Presented) The method according to Claim 112, wherein the film containing tungsten is formed at a temperature of about 300 to 450°C and on a pressure of about 0.5 to 80 Torr.

117. (Previously Presented) The method according to Claim 112, wherein the film containing tungsten is made of W or WSix.

118. (Currently Amended) The method according to Claim 112 113, wherein the nitriding of the film is performed by ~~using MMH gas generating plasma under the~~ following process conditions:

~~an amount of MMH gas: about 1-20 seem,~~

temperature: about 300-450°C, and

pressure: about 0.1-5 Torr.

119. (Canceled).

120. (Currently Amended) The method according to Claim 112, wherein the film containing tungsten nitrided is made of WN<sub>x</sub> or WSixNy.

121. (Currently Amended) A method of forming a barrier metal film formed of a nitride film including tungsten by thermal CVD, comprising:

positioning a substrate in a processing vessel;

~~maintaining a pressure in~~ evacuating the processing vessel;

forming a film containing tungsten on one side of the substrate by supplying a process gas including a gas containing tungsten and a gas containing hydrogen into the processing vessel;

shutting off the supplying of the process gas containing tungsten and gas containing hydrogen into the processing vessel;

completely removing the gas containing tungsten from the processing vessel by supplying an inert gas as a purging gas into the processing vessel, while evacuating the processing vessel; and

nitriding the film containing tungsten by supplying NH<sub>3</sub> gas.

122. (Previously Presented) The method according to Claim 121, wherein the nitriding of the film is performed by generating plasma.

123. (Previously Presented) The method according to Claim 121, wherein said nitriding comprises supplying at least one of MMH, and N<sub>2</sub>.

124. (Currently Amended) The method according to Claim 121, wherein the gas containing H<sub>2</sub> hydrogen includes at least one of H<sub>2</sub> gas, SiH<sub>4</sub> gas, Si<sub>2</sub>H<sub>6</sub> gas, and SiH<sub>2</sub>Cl<sub>2</sub> gas.

125. (Cancelled).

126. (Currently Amended) A method of forming a barrier metal film formed of a nitride film including tungsten by thermal CVD comprising:

positioning a substrate in a processing vessel;

~~maintaining a pressure in~~ evacuating the processing vessel;

forming a film containing tungsten on one side of the substrate by supplying a process gas including WF<sub>6</sub> gas and SiH<sub>4</sub> gas or H<sub>2</sub> gas into the processing vessel;

shutting off the supplying of the ~~WF<sub>6</sub> gas and SiH<sub>4</sub> gas or H<sub>2</sub> process~~ gas into the processing vessel;

completely removing the WF<sub>6</sub> process gas from the processing vessel by supplying an inert gas as a purging gas into the processing vessel, while evacuating the processing vessel; and

nitriding the film containing tungsten by supplying a gas containing ~~at least one of~~ NH<sub>3</sub> gas and N<sub>2</sub> and forming a plasma of the gas containing ~~at least one of~~ NH<sub>3</sub> gas and N<sub>2</sub>.

127. (Currently Amended) The method according to claim 126, wherein said nitriding comprises supplying MMH gas and N<sub>2</sub> gas.

128. (Previously Presented) The method according to Claim 126, wherein the film containing tungsten is formed at a temperature of about 300 to 450°C.

129. (Canceled).

130. (Canceled).

131. (New) A method of forming a barrier metal film formed of a nitride film including metal by thermal CVD, comprising:

positioning a substrate in a processing vessel;  
evacuating the processing vessel;  
forming a film containing metal on one side of the substrate by supplying a process gas including a gas containing metal and a gas containing hydrogen into the processing vessel;  
shutting off the supplying of the process gas into the processing vessel;  
completely removing the process gas from the processing vessel by supplying an inert gas as a purging gas into the processing vessel, while evacuating the processing vessel; and  
nitriding the film containing metal by supplying NH<sub>3</sub> gas.

132. (New) The method according to Claim 131, wherein the nitriding of the film is performed by generating plasmas.

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133. (New) The method according to Claim 131, wherein the nitriding of the film is performed in another processing vessel.

134. (New) The method according to Claim 131, wherein said nitriding comprises supplying at least one of MMH and N<sub>2</sub>.

135. (New) The method according to Claim 131, wherein the film containing metal is formed of a metal film or metal-silicide film.

136. (New) The method according to Claim 126, wherein the film containing tungsten is made of W or WSix.

137. (New) The method according to Claim 126, wherein the nitride film containing tungsten is made of WX<sub>x</sub> or WSixNy.